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(54) **METHOD OF PRINTING BARCODE CORRESPONDING TO XML DATA**

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a method of printing a barcode corresponding to XML(extensible markup language) data dispensing with data-conversion on a PC by handling the data as the XML data even when command systems of barcode printers are different from each other.

SOLUTION: The data of a data field in the XML data is converted to a data command for a barcode printer 12 by a conversion script 13 or a conversion table 14 and then the barcode is printed.
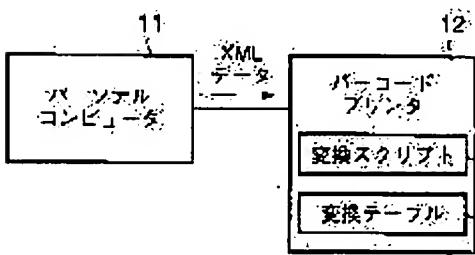
LEGAL STATUS

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]
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0001]
[Field of the Invention] This invention relates to the printing approach of the bar code corresponding to XML data which can print the bar code printer currently used broadly using XML data in FA (factory automation), the distribution industry, etc.


[0002]
[Description of the Prior Art] A bar code printer is connected to a personal computer (PC is called hereafter), bar code data are transmitted to a bar code printer from PC, and the printer system he is trying to print a bar code in a bar code printer is known.
[0003] In such a case, it sets and various commands are transmitted to the bar code printer from PC. As a class of this command, it has various command systems with the bar code printer.

[0004]
[Problem(s) to be Solved by the Invention] Therefore, according to the command system which the bar code printer has, PC needed to create the application program. Therefore, the application program to the bar code printer which has a different command system was mutually incompatible. For this reason, when the same data are stored in a database, when transmitting, or when printing, after changing into the format of a bar code printer, respectively, it needed to transmit to the bar code printer.

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[0005] This invention was made in view of the above-mentioned point, and the purpose has carried out data conversion in PC by dealing with data as XML (extensible markup language) data to offer the printing approach of the unnecessary bar code corresponding to XML data, even when the command systems of a bar code printer differ.

[0006]
[Means for Solving the Problem] After the printing approach of the bar code according to claim 1 corresponding to XML data changes the data of the data field in XML data into the data command of a bar code printer with SUTORIPUTO or a translation table, it is characterized by making it print a bar code.

[0007] The printing approach of the bar code according to claim 2 corresponding to XML data is characterized by making it make the data field number of a data command fluctuate automatically, when two or more data which have the same XML tag in XML data exist and it changes into the data command of a bar code printer, in case the data of the data field in XML data are changed into the data command of a bar code printer using a translation table according to claim 1.

[0008] The printing approach of the bar code according to claim 3 corresponding to XML data is characterized by the format currently held at the bar code printer being chosen by the format assignment information included in XML data according to claim 1.

[0009] The printing approach of the bar code according to claim 4 corresponding to XML data is characterized by using the format described as a printing format of XML data according to the command format of the bar code printer set as the bar code printer, and making it print the data of the data field in XML data.

[0010] The printing approach of the bar code according to claim 5 corresponding to XML data is characterized by using the format specified in the <?STYLESHEET--?> line as printing data of XML data, and printing the data of the data field in XML data.

[0011]
[Embodiment of the Invention] Hereafter, with reference to a drawing, the gestalt of operation of the 1st of this invention is explained. First, with reference to drawing 1 , the system common to the gestalt of each operation is explained. In drawing, 11 is a personal computer (PC is called hereafter). External connection of the bar code printer 12 is made at this PC11. A command required in order to print a bar code from this PC11 with XML data to a bar code printer 12 is transmitted. In a bar code printer 12, the XML data sent from PC11 are interpreted, and after being changed into the printing command written by the command format of a bar code printer proper and being changed, it is printed.

[0012] The translation table shown in a script as shown in a bar code printer 12 at drawing 3 , or drawing 7 is memorized. About these scripts or a translation table, it mentions later with reference to drawing 3 or drawing 7 . Furthermore, the program which performs processing shown in the flow chart of drawing 6 in the memory (not shown) of this bar code printer 12 is memorized.

[0013] First, an example of the XML data transmitted to a bar code printer 12 from PC11 with reference to drawing 2 is explained. In drawing 2 , it is shown in (1) which is the 1st line that these data are an XML document. Moreover, it is the part which specifies the format script called the style sheet which specifies the display format of the XML data of drawing 2 etc. to (2) which is the 2nd line. Moreover, (3) or subsequent ones which is the 3rd line is actual data. For the contents surrounded with the tag in this data, at this example, <COMPANY> is TOB with data. At TOC, <DIVISION> is Barcorde. Two data called Division are specified. Here, <DOC> is the tag in which initiation and termination of an XML document are shown, and <ITEM> is a tag in which the break of an item is shown.

[0014] Moreover, drawing 3 is the printing command written by the command format of a bar code printer 12. The PC command (11) of the 1st line and the 3rd line and (13) are the commands which specify the classification of the coordinate which prints a character string, magnitude, and a font etc., and the RC command (12) of the 2nd line and the 4th line and (14) are commands which specify the printing data corresponding to it. Here, the data of RC001 are printed and a format of PC001 and the data of RC002 are printed in a format of PC002.

[0015] Moreover, the XS command (15) of the 5th line is a printing initiation command.

[0016] Moreover, a script 13 is registered into a bar code printer 12.

[0017] This script 13 has <COMPANY (22)> and the description <DIVITION (24)> in the 4th line with the 2nd line, as shown in drawing 4 . This means that this description replaces the data of the data field of XML data.

[0018] Next, actuation of the gestalt of operation of the 1st of this invention is explained, referring to the flow chart of drawing 5 and drawing 6 . The flow chart of drawing 5 explains the processing which a user performs to a bar code printer 12. First, a user registers the script shown in the bar code printer 12 at A. This script is registered into a bar code printer 12 as a registration script 13. Next, a user transmits the XML data which operated PC11 and were shown in the bar code printer 12 by B.

[0019] Although Generation C and Printing D of the command described below are performed by the bar code printer 12, the processing performed with the bar code printer 12 is explained with reference to the flow chart of drawing 6 .

[0020] The processing which changes into the command of a bar code printer the XML data performed in a bar code printer 12 with reference to drawing 6 is explained. First, a bar code printer 12 transmits XML data to PC11.

[0021] A bar code printer 12 receives the data transmitted from PC11 (step S11). And it is judged whether this received data is the command of a bar code printer (step S12).

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When judged with "YES" by the judgment of this step S12, the usual printing processing is usually performed as processing using the command of this bar code printer (step S13).

[0022] On the other hand, when judged with "NO" by the judgment of step S12, it is judged whether the received data are XML data (step S14). This judgment is judged by whether the data <?XML" are in the head of the received XML data. It becomes a command error when judged with "NO" by the judgment of this step S14 (step S15).

[0023] On the other hand, when judged with "YES" by the judgment of step S14, processing which receives a tag is performed (step S16). Here, <DOC> shows an initiation tag and </DOC> means a termination tag.

[0024] And it is judged whether a tag is a termination tag of XML data (step S17). If judged with "NO" by the judgment of this step S17, with reference to the script 13 registered into the script 13, it will be judged whether the tag of the received XML data is described by the script 13 (step S18).

[0025] When judged with "YES" by the judgment of this step S18, the data of a tag are changed into the command of a bar code printer in a script 13 (step S19).

[0026] And it returns to step S16. And the following tag is received, and if the tag is not an XML end-of-data tag, with reference to the script 13 registered, the data of a tag will be changed into the command of a bar code printer in a script 13 (step S19). That is, COMPANY> or <DIVISION> registered into the script 13 is changed into "TOC" or "Barcorde Division" described in XML data.

[0027] It is judged [ be / the tag which repeated the above processing similarly and was received / a termination tag of XML data ] with "YES" by the judgment of step S17, and let a printer 12 be an idle state (step S20).

[0028] Thus, the command of the bar code printer shown in C of drawing 5 is generated. And the contents are printed.

[0029] As mentioned above, according to the gestalt of operation of the 1st of this invention, a script can be registered into a bar code printer and the data of the data field in XML data can be changed into the data of a bar code command by Lycium chinense. Therefore, a bar code can be printed with the XML data transmitted from PC11.

[0030] Next, the gestalt of operation of the 2nd of this invention is explained with reference to drawing 7 thru/or drawing 12 . Drawing 7 shows the contents beforehand registered into the translation table 14. This translation table 14 means that <COMPANY> is changed into RC001 data and <DIVISION> is changed into RC002 data.

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[0031] Drawing 8 shows the contents changed by the translation table 14, drawing 9 extracts only the formatting command in a bar code command, and drawing 10 is a printing initiation command.

[0032] Actuation of the gestalt of operation of the 2nd of this invention is explained referring to drawing 11 and drawing 12 . The flow chart of the flow chart of drawing 11 explains the processing which a user performs to a bar code printer 12. First, a user registers the translation table 14 shown in the bar code printer 12 at drawing 7 (step A1). Next, the formatting command shown in the bar code printer 12 at drawing 9 is transmitted (step B1).

[0033] And XML data are transmitted (step C1). A translation table 14 is referred in a bar code printer 12 by transmission of this XML data, and the data command shown in drawing 8 is generated (step D1).

[0034] And the issue command shown in drawing 10 to the bar code printer 12 is transmitted (step E1).

[0035] Next, the processing which changes into the command of a bar code printer the XML data performed in a bar code printer 12 with reference to the flow chart of drawing 12 is explained. First, PC11 transmits XML data to a bar code printer 12.

[0036] Next, a bar code printer 12 receives the data transmitted from PC11 (step S21). And it is judged whether this received data is the command of a bar code printer (step S22). When judged with "YES" by the judgment of this step S22, the usual printing processing is usually performed as processing using the command of this bar code printer (step S23).

[0037] On the other hand, when judged with "NO" by the judgment of step S22, it is judged whether the received data are XML data (step S24). This judgment is judged by whether the data <?XML" are in the head of the received XML data. It becomes a command error when judged with "NO" by the judgment of this step S24 (step S25).

[0038] On the other hand, when judged with "YES" by the judgment of step S24, processing which receives a tag is performed (step S26). Here, <DOC> shows an initiation tag and </DOC> means a termination tag.

[0039] And it is judged whether a tag is a termination tag of XML data (step S27). If judged with "NO" by the judgment of this step S27, with reference to the table registered into the translation table 14, it will be judged whether the tag of the received XML data is described by the translation table 14 (step S28).

[0040] When judged with "YES" by the judgment of this step S28, the data of a tag are changed into the command of a bar code printer with a translation table 14 (step S29). That is, <COMPANY> in the XML data transmitted to a bar code printer 12 from PC11

is used as RC001 data, and <DIVISION> is set to RC002. Consequently, a data command is created as shown in drawing 8 .

[0041] And it returns to step S26. And the following tag is received, and if the tag is not an XML end-of-data tag, with reference to the translation table 14 registered, the data of a tag will be changed into the command of a bar code printer with a translation table 14 (step S19).

[0042] It is judged [ be / the tag which repeated the above processing similarly and was received / a termination tag of XML data ] with "YES" by the judgment of step S27, and let a printer 12 be an idle state (step S30).

[0043] Thus, the data command of a bar code shown in drawing 8 is generated. And the contents are printed.

[0044] As mentioned above, according to the gestalt of operation of the 2nd of this invention, the data of the data field in XML data are convertible for the data of a bar code command by storing a translation table 13 in a bar code printer 12. Therefore, a bar code can be printed with the XML data transmitted from PC11.

[0045] Next, the gestalt of operation of the 3rd of this invention is explained with reference to drawing 13 thru/or drawing 15 . The flow chart of drawing 13 is for explaining the processing which a user performs to a bar code printer 12. First, a user transmits the translation table 14 of XML data to a bar code printer 12 (step A2). Next, a format and an issue command are registered in the name of arbitration to a bar code printer 12 (step B-2). In the gestalt of this operation, it has registered by the identifier of format1.

[0046] Next, the correspondence table of the format shown in drawing 14 is registered into a bar code printer 12 (step C2). The table corresponding to a format of drawing 14 enables it to choose a format of arbitration automatically from two or more formats registered into the bar code printer 12 interior by the keyword contained in XML data. The table of drawing 14 shows using the format and issue command which are saved by the identifier of "format1" to the keyword as format assignment information of "style1.dsl", and using the format and issue command which are saved by the identifier of "format2" to the keyword "style2.dsl." Although the table corresponding to a format of drawing 14 has two keywords, it may be not only two but three or more.

[0047] And XML data are transmitted to a bar code printer 12 (step D2). Next, the formatting command which the table corresponding to the format shown in drawing 14 was referred to, and was saved to the printer 12 is executed (step E2).

[0048] Next, the processing changed into a data command with reference to a translation table 14 is made (step F2). Next, the issue command which the table corresponding to the format shown in drawing 14 was referred to, and was saved at the bar code printer 12 is executed (step G2).

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[0049] Next, with reference to drawing 15 , actuation of the gestalt of operation of the 3rd of this invention is explained. First, a bar code printer 12 transmits XML data to PC11.

[0050] Then, a bar code printer 12 receives the data transmitted from PC11 (step S31). And it is judged whether this received data is the command of a bar code printer (step S32). When judged with "YES" by the judgment of this step S32, the usual printing processing is usually performed as processing using the command of this bar code printer (step S33).

[0051] On the other hand, when judged with "NO" by the judgment of step S32, it is judged whether the received data are XML data (step S34). This judgment is judged by whether the data <?XML" are in the head of the received XML data. It becomes a command error when judged with "NO" by the judgment of this step S34 (step S35).

[0052] On the other hand, when judged with "YES" by the judgment of step S34, processing which receives a tag is performed (step S36). Here, <DOC> shows an initiation tag and </DOC> means a termination tag.

[0053] Next, it is judged whether there is any keyword specified as the table corresponding to the format shown in drawing 14 (step S37). When the keyword specified as the table corresponding to a format of drawing 14 when judged with "YES" by the judgment of this step S37 exists, a corresponding formatting command is executed (step S38).

[0054] And it is judged whether a tag is a termination tag of XML data (step S39). If judged with "NO" by the judgment of this step S39, with reference to the table registered into the translation table 14, it will be judged whether the tag of the received XML data is described by the translation table 14 (step S40).

[0055] When judged with "YES" by the judgment of this step S40, the data of a tag are changed into the command of a bar code printer with a translation table 14 (step S41).

[0056] Thus, a data command is generated using a translation table 14 like the gestalt of the 2nd operation.

[0057] And it returns to step S36. And the following tag is received, and if the tag is not an XML end-of-data tag, with reference to the translation table 14 registered, the data of a tag will be changed into the command of a bar code printer with a translation table 14 (step S41).

[0058] It is judged [ be / the tag which repeated the above processing similarly and was received / a termination tag of XML data ] with "YES" by the judgment of step S39, and issue activation of the table corresponding to the format shown in drawing 14 is made (step S42), and let a printer 12 be an idle state (step S43).

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[0059] According to the gestalt of operation of the 3rd of this invention, the data of the data field in XML data are [ like ] above convertible for the data of a bar code command by storing a translation table 13 in a bar code printer 12. Therefore, a bar code can be printed with the XML data transmitted from PC11. Furthermore, since the keyword which specifies two or more formats was put in into the XML data transmitted to a bar code printer 12 from PC11, various formats can be specified.

[0060] Next, the gestalt of operation of the 4th of this invention is explained with reference to drawing 16 thru/or drawing 19 . The gestalt of this 4th operation has taken for the example the case where two or more two items mentioned above, for example, items, such as <COMPANY>, exist in XML data with the gestalt of the 2nd operation.

[0061] Drawing in which drawing 16 shows the XML data with which two or more items exist in XML data, the block diagram showing an example of a translation table, as for drawing 17 , drawing showing the format which uses drawing 18 with the gestalt of operation, drawing in which drawing 19 shows the condition that XML data were changed into the data command of a bar code printer, and drawing 20 are the flow charts for explaining actuation of the gestalt of operation of the 4th of this invention.

[0062] First, PC11 transmits XML data to a bar code printer 12.

[0063] Then, a bar code printer 12 receives the data transmitted from PC11 (step S51). And it is judged whether this received data is the command of a bar code printer (step S52). When judged with "YES" by the judgment of this step S52, the usual printing processing is usually performed as processing using the command of this bar code printer (step S53).

[0064] On the other hand, when judged with "NO" by the judgment of step S52, it is judged whether the received data are XML data (step S54). This judgment is judged by whether the data <?XML" are in the head of the received XML data. It becomes a command error when judged with "NO" by the judgment of this step S54 (step S55).

[0065] On the other hand, when judged with "YES" by the judgment of step S44, processing which receives a tag is performed (step S56). Here, <DOC> shows an initiation tag and </DOC> means a termination tag.

[0066] And it is judged whether a tag is a termination tag of XML data (step S57). When judged with "NO" by the judgment of this step S57, with reference to the table registered into the translation table 14, the data of a tag are changed into the command of a bar code printer with a translation table 14 (step S58).

[0067] On the other hand, when judged with "YES" by the judgment of step S57, after only "1" increments the data command number of a bar code printer, processing of step S58 mentioned above is performed.

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[0068] That is, if drawing 19 is seen, "1" increment of the data command number will be automatically carried out so that clearly.

[0069] In addition, although "1" increment of the data command number was carried out with the gestalt of this operation, it may be made to carry out "1" decrement.

[0070] Since a data field number can be automatically given according to the gestalt of operation of the 4th of this invention as mentioned above when two or more same XML tags exist in XML data, operability can be improved.

[0071]
[Effect of the Invention] Since a bar code is printable with XML data according to this invention as explained in full detail above, the printing approach of the bar code corresponding to the XML data to which it can be supposed that the needlessness of the application for data conversion is carried out can be offered.

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[Translation done.]

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]
[Drawing 1] The block diagram showing the work environment to which the printing approach of the bar code printer corresponding to the XML data concerning the gestalt of each operation of this invention is applied.
[Drawing 2] Drawing showing the example of the XML data concerning the gestalt of operation of the 1st of this invention.
[Drawing 3] Drawing showing the example of a printing command written by the command format of the bar code printer concerning the gestalt of this operation.
[Drawing 4] Drawing showing the script concerning the gestalt of this operation.
[Drawing 5] The flow chart for explaining the processing which the user concerning the gestalt of this operation performs to a printer.
[Drawing 6] The flow chart for explaining actuation of the gestalt of this operation.
[Drawing 7] Drawing showing the contents of the translation table concerning the gestalt of operation of the 2nd of this invention.
[Drawing 8] Drawing showing the data command of the bar code printer concerning the gestalt of this 2nd operation.
[Drawing 9] Drawing which extracted only the formatting command in the bar code command concerning the gestalt of this 2nd operation.
[Drawing 10] Drawing showing the issue command concerning the gestalt of this 2nd operation.
[Drawing 11] The flow chart for explaining the processing which the user concerning the gestalt of operation of the 2nd of this invention performs to a printer.
[Drawing 12] The flow chart for explaining actuation of the gestalt of this 2nd operation.
[Drawing 13] The flow chart for explaining the processing which the user concerning the gestalt of operation of the 3rd of this invention performs to a printer.
[Drawing 14] Drawing showing the table corresponding to the format concerning the gestalt of operation of the 3rd of this invention.
[Drawing 15] The flow chart for explaining actuation of the gestalt of operation of the 3rd of this invention.
[Drawing 16] Drawing showing the XML data with which two or more items exist in the XML data concerning the gestalt of operation of the 4th of this invention.
[Drawing 17] The block diagram showing a translation table example concerning the gestalt of this 4th operation,
[Drawing 18] Drawing showing the format used with the gestalt of this 4th operation.
[Drawing 19] Drawing showing the condition that the XML data concerning the gestalt of this 4th operation were changed into the data command of a bar code printer.

[Drawing 20] The flow chart for explaining actuation of the gestalt of operation of the 4th of this invention.
[Description of Notations]
11 -- Personal computer,
12 -- Bar code printer,
13 -- Script,
14 -- Translation table.

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[Translation done.]